Women's empowerment through openness: OER, OEP and the Sustainable Development Goals

Open Praxis, vol. 8 issue 2, April–June 2016, pp. 163–180 (ISSN 2304-070X)
2016 Open Education Global Conference Selected Papers

OPEN PRAXIS
INTERNATIONAL COUNCIL FOR OPEN AND DISTANCE EDUCATION

Women's empowerment through openness: OER, OEP and the Sustainable Development Goals

Leigh-Anne Perryman & Beatriz de los Arcos
The Open University (United Kingdom)
leigh.a.perryman@open.ac.uk & B.De-Los-Arcos@open.ac.uk

Abstract

This paper explores the potential of open educational resources (OER) and open educational practices (OEP) in helping achieve women's empowerment in the developing world. Our evidence comprises the Open Education Research Hub open dataset, featuring survey responses from 7,700 educators, formal and informal learners from 175 countries concerning the use of OER, the barriers faced in respect of OER adoption and OEP engagement, and the perceived impact of OER on teaching practices. Our findings indicate that OER and OEP can give women a voice, access to information and education, and the opportunity to connect with peers and train others. However, they also highlight extreme inequalities in digital empowerment and extensive technological barriers to digital participation. We argue that while such technological barriers certainly need removing, the potential of openness can only fully be realised when 'offline' societal and economic barriers to women's empowerment are also minimised.

Keywords: Sustainable development goals, Women's empowerment, OER, open educational practices, gender, developing countries

Introduction: Conceptual framework and background

Women's empowerment has been a feature of development assistance since the 1990s. O'Neil, Domingo and Valters (2014, p. 2) note that "given the continued resistance to 'gender issues' in some parts of the development community, this alone is an achievement". In 2015 the pursuit of women's empowerment was given fresh momentum when, on 25 September, the 193 countries of the UN General Assembly adopted the 2030 Development Agenda, comprising an intergovernmental set of 17 aspirational Sustainable Development Goals (SDG) with 169 targets. Women's empowerment is the focus of Goal 5, which includes amongst its targets one of only 4 references to ICT amongst the SDG: "Enhance the use of enabling technology, in particular information and communications technology (ICTs), to promote the empowerment of women" (Target 5b). This paper builds on existing research around women's use (and non-use) of ICTs in the developing world, taking a detailed look at the implications for women's empowerment of a particular aspect of ICT—open educational resources (OER) and open educational practices (OEP).

A closer look at women's empowerment, and the relationship with ICTs

Empowerment can be defined as the "process by which those who have been denied the ability to make strategic life choices acquire such an ability" (Kabeer, 1999, p. 435). Kabeer's emphasis on process identifies three interrelated dimensions underpinning the ability to make choices: resources (material, human and social), agency and achievements (wellbeing outcomes). As such it parallels Amartya Sen's (1999) concept of development as a process of empowerment involving the removal of 'unfreedoms' that preclude choice and full participation in social and economic life. Gurumurthy and Chami (2014), researching women, local governance and ICTs, have developed a research framework (Figure 1) analysing how ICT contributes to women's empowerment through the expansion

Reception date: 5 February 2016 • Acceptance date: 8 April 2016
DOI: http://dx.doi.org/10.5944/openpraxis.8.2.289

of choice in three areas: informational power, communicative power and associational power. The framework also identifies structural and agency-related factors influencing women's empowerment through ICT and has informed our own study.

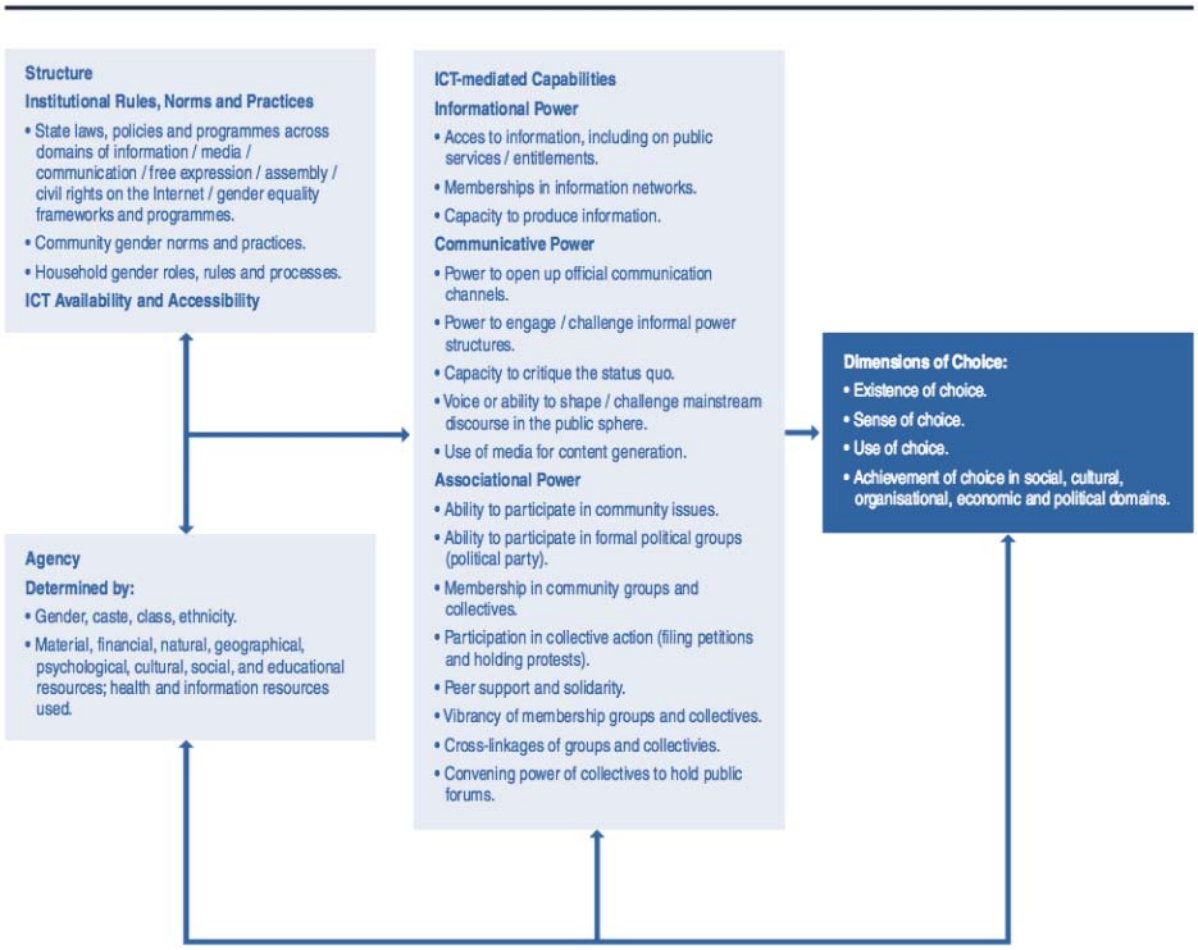

Figure 1: Theoretical Framework developed by Gurumurthy and Chami (2014), drawing on Kleine's (2008) Choice Framework and the Active Citizenship Framework of the Women-gov project. Source: World Wide Web Foundation (2015, p. 11)

Other research (e.g. Sandys, 2005) identifies particular health-related benefits of the increased access to information offered through women's use of ICTs, and many note that the various benefits of digital equality extend beyond individual women's lives to those of their families, and to their communities.

Women's digital exclusion

SDG 5, Target 5b acknowledges the fact that despite the potential for ICT use to contribute to women's empowerment, women's use of ICT is greatly lagging behind that of men in the developing world, with relatively little improvement in this situation over recent years. For example, Mijumbi (2002), exploring women's digital exclusion in Uganda, identified diverse barriers to women's ownership and use of ICTs including:

- Gender inequalities;
- Inadequate gender-sensitive policies supporting women's ICT use;
- Remote geographic locations with unreliable transportation infrastructure;
- Poor ICT infrastructure in rural areas;
- Illiteracy and lack of self-efficacy to use ICTs.

Seven years later, Patil, Dhere and Pawar (2009) concluded that 'oppressive gender relations' were inhibiting women's access to and ownership of ICTs in India and by 2015 a study of poor urban men and women across 9 developing countries by the World Wide Web Foundation (2015) reported that while nearly all women and men in those countries own a phone, women are still nearly 50% less likely to access the Internet than men in the same communities, with Internet use reported by just 37% of women surveyed and Internet-using women being 30–50% less likely than men to use the Internet to increase their income or participate in public life (World Wide Web Foundation, 2015). Table 1 shows the gender gap in Internet use across the 9 countries studied.

Table 1: Country-specific overall Internet use and women's use in particular (from World Wide Web Foundation, 2015, p. 13)

	Urban Population (% of total) (World Bank)	Total % Internet users (WF)	Total % Male Internet Users (WF)	Total % Female Internet Users (WF)	Gender Gap in Internet Use (WF)*	% individuals using the Internet (ITU)[5]	UN HDI Gender Inequality Index rank) (2014)[6]
Yaounde Cameroon	43%	38%	45%	36%	-25%	11	130
Bogotá Colombia	76%	73%	76%	71%	-7%	52.57	92
New Delhi India	53%	46%	53%	47%	+9%	18	103
Jakarta Indonesia	16%	36%	50%	31%	-67%	17.14	115
Nairobi Kenya	47%	29%	57%	20%	-185%	43.40	--
Maputo Mozambique	44%	40%	59%	33%	-79%	5.94	78
Lagos Nigeria	32%	44%	66%	36%	-83%	42.68	146
Manila Philippines	25%	45%	42%	46%	+9%	32.69	122
Kampala Uganda	32%	38%	61%	21%	-190%	17.71	115

* Gender Gap in Internet Use (WF): % Male Internet Users – % Female Internet Users / & Female Internet Users multiplied by 100 = % gap

The report identifies education and age as "the most important socio-economic drivers of the gender gap in ICT access", with older, less educated women having far less access than younger, more educated women: "Controlling for income, women who have some secondary education or have completed secondary school are six times more likely to be online than women with primary school or less" (World Wide Web Foundation, 2015, p. 5). Additional drivers identified include the cost of Internet access, the impact of 'patriarchy online' and men's censorship of what women see on the Internet.

In the same year the World Wide Web Foundation report was published, Potnis (2015) gave a detailed account of both economic and non-economic reasons for the gender gap in ICT use in developing countries. Studying Indian women's digital exclusion, and focusing on mobile phone ownership (which Madianou and Miller, 2011; and Potnis, 2011, cited in Potnis, 2015, identify as

playing a key role in empowering women in developing countries), Potnis explains that in India, mobile phones are by far the most common method of accessing the Internet but only 30% of mobile phones are owned by women. Potnis (2015, p. 2) observes that many of the inequalities posing a barrier to ICT use for women in the developing world replicate broader social inequalities. She divides barriers to women's ICT ownership and digital participation into micro-level (individual), meso-level (related to family or group) and macro-level (regional or national), with reference to related literature (Table 2).

Table 2: Barriers reinforcing the digital divide (adapted from Potnis, 2015, p. 3)

Inequalities and Respective Barriers	Micro-Level	Meso-Level	Macro-Level
Socio-Cultural (e.g. oppressing gender roles for women in male-dominated societies; religious beliefs and practices) (Bourdieu, 1986; Hafkin and Huyer, 2008)	• Women's lack of freedom to make decisions	• Neighbourhood with high crime rate or poverty. • Membership of organizations facilitating access to new media.	• Social norms (e.g. parents saving money for the education of their male child but for the wedding of a female child).
Economic (e.g. inflation, lack of economic opportunities) (Annafari et al., 2013; Rice and Katz, 2003)	• Lack of employment. • Inability to afford ownership of ICTs.	• Low household income.	• High fees for ICT-based services.
Demographic (e.g. lower caste, less education) (DiMaggio and Cohen, 2003; Zainudeen et al., 2010; Dijk, 2005)	• Illiteracy. • Lack of knowledge and/or skills.		• Shortage of ICT teachers. • Dominance of English on the Internet.
Psychological (e.g., beliefs creating an inferiority complex among women) (Madianou and Miller, 2011)	• Adverse attitudes toward ICTs (e.g. apathy about ICT adoption). • Lack of self-efficacy to own and/or use ICTs.		
Geographic (e.g. rural vs. urban location, poor transportation infrastructure) (European Commission, 2005)		• Long distances to ICT facilities.	• Lack of ICT infrastructure (e.g. poor signal strength).

Research around openness and development

This paper's focus on the potential of OER and OEP to help increase women's empowerment in the Global South has links with broader research into the impact of OER projects in development settings. For example, since 2013 the ROER4D project (http://roer4d.org) has been conducting evidence-based research on OER impact and use in South America, Sub-Saharan Africa and South/South East Asia and the OER Research Hub (now the Open Education Research Hub) have also researched OER use and impact in India (see Perryman, Buckler & Seal, 2014; Buckler, Perryman,

Seal & Musafir, 2014; Perryman & Seal, 2015) and across the member states of the Virtual University for Small States of the Commonwealth (see Perryman & Lesperance, 2015). However, very little research has considered the potential of OER and OEP to help increase women's empowerment in the Global South, though related research on the broader topic of ICT and women's empowerment is growing (e.g. IT for Change, 2014; World Wide Web Foundation, 2015), in part driven by SDG5b.

Our own research, reported in this paper, draws on the open dataset produced by the Open Education Research Hub (OERH) as the basis for addressing three questions:

- To what extent are women being empowered in developing countries through OER and OEP?
- What are the barriers to women's empowerment in developing countries through open educational resources and practices?
- How might those barriers be removed?

Methods

Since 2013 the Hewlett-funded Open Education Research Hub (OERH), formerly Open Educational Resources Research Hub (OERRH), has collaborated with a range of projects and initiatives around the world and across educational sectors to gather evidence of the impact of OER use on teaching and learning, and facilitate comparative research. From a bank of questions (http://bit.ly/OERHUBSurveyQuestions) designed to test eleven hypotheses (de los Arcos, Farrow, Perryman, Pitt & Weller, 2014) and explore teachers', formal and informal learners' perceptions of, and attitudes towards, open educational resources, a number of surveys were drafted and administered via some of the OERRH collaborations (e.g. OpenLearn, Siyavula, the Virtual University for Small States of the Commonwealth-VUSSC, and TESS-India). In total, 7,700 valid responses were collected and analysed with an aim to:

- Profile users of OER—for example, their gender, age, academic qualifications and employment status;
- Assess such users' level of engagement with OER and identify the types of OER used and most popular repositories of open content;
- Learn about the reasons for OER use and the barriers to adopting OER;
- Evaluate the impact of open practices.

The entire data set is available under an open license (www.bit.ly/OERRH_SurveyData).

This paper analyses the OERH data in relation to women in the developing world's existing use of OER and their OEP (and how this compares to that in the developed world), with particular attention to women's interest in using OER, barriers to OER adoption, engagement with OER, and the perceived impact of OER on teaching practices. In order to categorise survey respondents, a distinction between developed and developing countries, or Global North and Global South, was made following Wikimedia's regional classification (https://meta.wikimedia.org/wiki/List_of_countries_by_regional_classification). SPSS software was employed in the analysis. Frequencies of all responses were calculated to have a general description of the data, and independent samples t-tests to examine whether there were statistically significant differences between women in the Global North and Global South, with North/South grouping as an independent variable. Cases with missing values were deleted analysis by analysis. Reliability was high on all subscales, i.e. Cronbach's Alpha on 9 items measuring the impact of using OER on teaching practices ($\alpha = .91$).

Sample Characteristics

The OERH dataset comprises 7,700 valid responses from 175 countries around the world, although most reside in the Global North (76%). Despite there being more female than male survey respondents overall (50.6%/48.4%), in developing countries female survey respondents account for only 36.6% (n=653). These women, however, are better qualified than their counterparts in the Global North: 71.6% of female respondents in the Global South hold either an undergraduate (31.4%) or postgraduate qualification (40.2%), a greater percentage than in the Global North (61.2%). Levels of employment amongst female respondents in developed countries are higher—43.5% work full-time and 20.8% part-time—but also, more women in the Global North state their status as unwaged with domestic responsibilities—6.4% compared to 3.2% in developing nations. Interestingly, while 10.9% of all OERH survey respondents declare a disability, this percentage increases to 14% for female respondents in the Global North, and decreases to 3.8% for women in the Global South. Equally revealing are the differences between North and South with regard to Internet access: while 87.9% of female respondents in developed countries have broadband in their homes compared to 65.2% in developing nations, access via a mobile device does not set the two groups widely apart —68.7% of female respondents in the Global North and 61% in the Global South use an Internet-enabled mobile phone. This is likely to be a reason for our not finding major dissimilarities in digital practices, with the exception of shopping online (Table 3).

Table 3: Digital Practices of female respondents in Global North and Global South

	GLOBAL NORTH		GLOBAL SOUTH	
	Count	%	Count	%
Sent an email	2204	98.8	385	94.6
Written a document using word processing software	2135	95.7	373	91.6
Used presentation software	1554	69.7	312	76.7
Performed calculations with spreadsheet software	1491	66.9	276	67.8
Contributed to a wiki (e.g. Wikipedia)	368	16.5	58	14.3
Written a blog post	695	31.2	109	26.8
Shared an image online	1397	62.6	205	50.4
Posted on a microblogging platform (e.g. Twitter)	823	36.9	122	30
Took part in a videochat (e.g. Skype)	1334	59.8	252	61.9
Contributed to an Internet forum	932	41.8	137	33.7
Contributed to a social network (e.g. Facebook)	1753	78.6	311	76.4
Used cloud-based storage (e.g. Google Drive)	1366	61.3	228	56
Shopped online	1975	88.6	231	56.8
Downloaded a podcast	1112	49.9	141	34.6
Downloaded a file using a torrent client	440	19.7	117	28.7
Filmed and uploaded video content	628	28.2	127	31.2
Used a virtual learning environment to study or teach	1114	50	180	44.2
Recorded and uploaded a podcast	175	7.8	39	9.6

Findings

Our analysis of female survey respondents in developed and developing countries shows significant differences in women's motivation to use OER and how they engage with OER, while exposing technology as an acute dividing factor affecting OEP and emphasizing the impact of OER in widening the range of teaching methods employed by educators in the Global South.

Interest in using OER

When asked about their interest in using OER, a comparison between responses from women in developed and developing countries reveals that the latter give more importance to the role of open resources in their professional development (68.4% vs 56%), training others at work (22.2% vs 6.7%) and improving both their non-native language skills (32.7% vs 14.6%) and study skills (57.3% vs 47.7%). All these differences were found to be statistically significant (Table 4).

A female educator from the VUSSC comments:

> Using OER puts you in contact with other teachers and you can learn from how they do things differently to you. I've changed a lot from using other people's materials. You can also share your own work with many more people than you could by just publishing it in a journal and as a teacher you can benefit greatly from their feedback and learn how to improve things.

A female respondent in India adds: 'Knowing OER has really helped me in motivating people to use and adopt [resources] in better ways. I train teachers on how to use OER effectively for their teaching and learning.'

Table 4: Independent samples t-tests of female survey respondents' interest in using OER

	M	SD	df	t	Effect Size°
Professional development			666.4	4.96*	.01
Global North	1.44	.49			
Global South	1.32	.46			
Training others at work			367	6.34*	.02
Global North	1.93	.25			
Global South	1.78	.41			
Improve study skills			434.6	3.11*	.00
Global North	1.52	.50			
Global South	1.43	.49			
Improve non-native language skills			408.6	6.73*	.02
Global North	1.85	.35			
Global South	1.67	.47			

*$p < .001$.
°Eta squared.

Extending the comparison to the responses of women and men in developing countries, we find that using OER for professional development, for training others at work and improving one's study skills are also ranked highly by male respondents. However, women are more motivated than men to use OER to improve their non-native language skills (32.7% vs 29.6%), to teach in an educational institution (30.3% vs 26%) and to find information rather than study a whole course (36.5% vs 28%).

Challenges of using OER

In relation to the barriers affecting the adoption of OER (Figure 2), although all survey respondents agree on the seriousness of overcoming technology problems when downloading resources, the challenge seems particularly severe for women in developing countries: 45.5% report technology as a barrier, compared with 27.3% of women in developed countries. Knowing where to find resources is ranked even higher as a barrier by female survey respondents in the Global South (50.8%), while the greatest difference between Global North and Global South refers to finding resources relevant to their local context—38.4% in developing and 28.4% in developed nations.

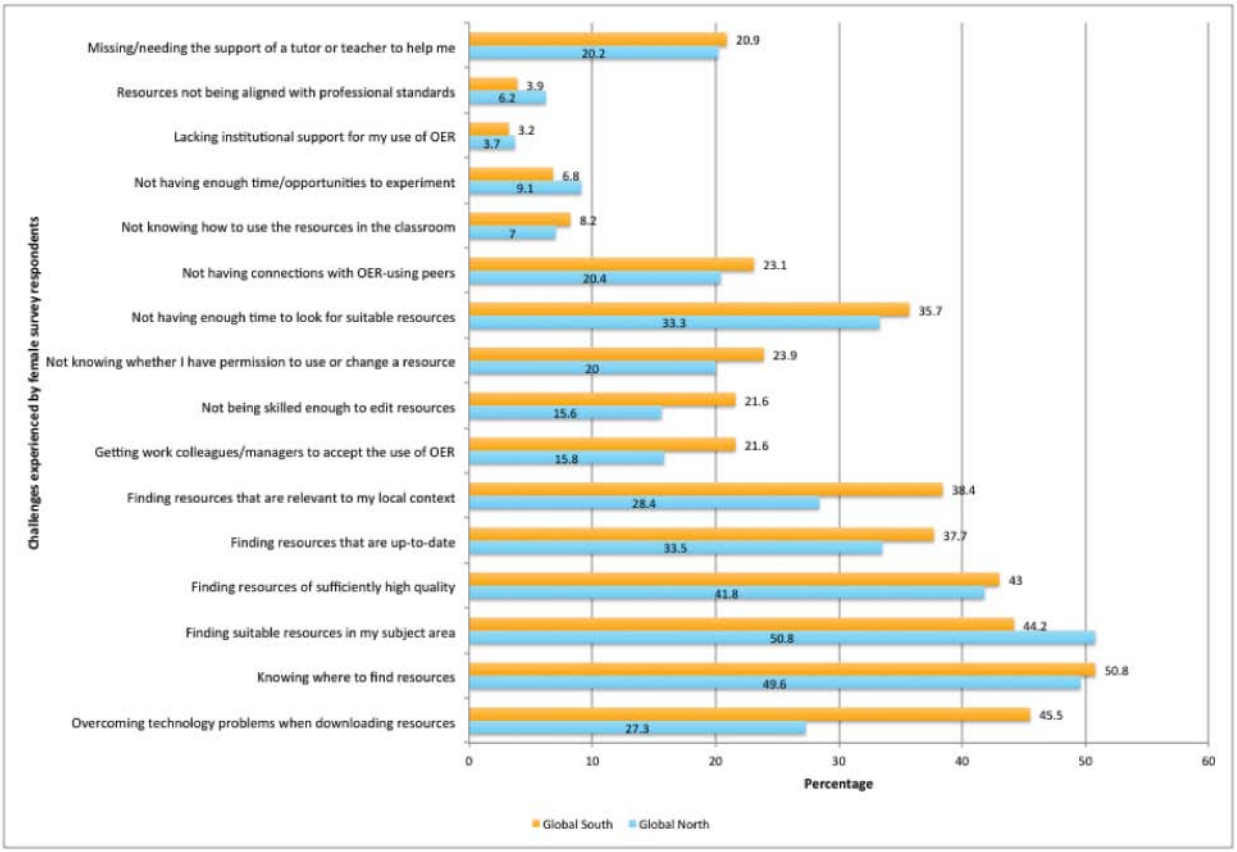

Figure 2: Challenges of OER use experienced by female survey respondents in the Global South and North

In addition to these barriers, independent samples t-tests reveal statistically significant differences regarding women's perception of their ability to edit resources to suit their needs, getting work colleagues/managers to accept the use of OER, and finding suitable resources in their subject area (Table 5).

Table 5: Independent samples t-tests of female respondents' evidence regarding challenges in using OER

	M	SD	df	t	Effect Size°
Overcoming technology problems			498.2	6.47*	.01
Global North	1.73	.44			
Global South	1.54	.49			
Not being skilled enough to edit resources			548.1	2.68**	.003
Global North	1.84	.36			
Global South	1.78	.41			
Finding resources in my subject area			596.8	–2.37**	.002
Global North	1.49	.50			
Global South	1.56	.49			
Finding resources in my local context			565	3.76*	.006
Global North	1.72	.45			
Global South	1.62	.48			
Getting colleagues to accept use of OER			553	2.57**	.003
Global North	1.84	.36			
Global South	1.78	.41			

*$p < .001$, **$p < .01$
°Eta squared.

When analysing how the responses of men and women in the Global South differ in their perception of the challenges of using OER, although findings suggest that female respondents encounter generally higher levels of difficulty across all variables, statistically significant differences were only observed in finding context-relevant resources ($t = 2.40$, $df = 803$, $p < .05$), not knowing whether one has permission to use or change resources ($t = 2.16$, $df = 771$, $p < .05$), and not having enough time to look for suitable material ($t = 2.52$, $df = 794$, $p < .05$).

Engagement with OER

With reference to their engagement with OER (Table 6), female survey respondents in the Global South were found to have adapted resources to fit their needs (75.3%) and created resources for studying/teaching (28.3%) more often than female respondents in the Global North, but shared those resources online on an open license less frequently (6.5%). However, none of these differences were found to be statistically significant. Quotes such as 'I have started feeling that there is no harm in sharing my slides and other study material across the globe, as it would [be of] benefit to a larger section' possibly exemplify the embryonic but optimistic state of sharing practices in developing countries.

Table 6: Engagement with OER by women in the Global North/Global South

	GLOBAL NORTH		GLOBAL SOUTH	
	Count	%	Count	%
I have adapted open educational resources to fit my needs	668	74.1	186	75.3
I have created open educational resources for study or teaching	230	25.5	70	28.3
I have created resources myself and published them on a CC license	78	8.6	16	6.5

A comparison of types of OER highlights similar patterns of use in female respondents from developed and developing countries (Table 7).

Table 7: Types of OER used by women in the Global North/Global South

	GLOBAL NORTH (n= 2275) %	GLOBAL SOUTH (n= 528) %
Videos	65.8	66.4
Audio podcasts	36.2	32
Images	51.8	55.7
Infographics	22.9	22.9
Interactive games	24.8	28.6
Lectures	50.9	52.8
Lesson plans	39.5	37.5
Tutorials	51.2	54
Quizzes	50.7	46.6
Full course	42.6	39
Course module/unit	49.2	48.3
E-books	59.1	67.4
Open textbooks	62.7	70.5
Data sets	23.4	8.3
Learning tools, instruments, plugins	35	31.3

Female respondents in both developed and developing countries report comparable awareness of OER repositories, with YouTube (55.7% in the Global North vs 55.9% in the Global South), TEDTalks (38.8% vs 36.3%) and iTunes (36.7% vs 21.7%) being the most popular. Particularly notable is the fact that repositories specifically branded as 'free learning' and 'open' receive considerably less attention by both groups: MERLOT, for instance, is used by only 1.9% of female respondents in the Global North and 2.4% in the Global South; MIT courseware has been accessed by 16.4% in the Global North and 16.2% in the Global South; and Connexions by 2.6% and 3.7% respectively. Local repositories seem to fare better: a look at responses from female educators in India indicate widespread use of eGyanKosh (59%) and the National Repository of Open Educational Resources (NROER) (18.7%), although still below the prevalence of YouTube (65.6%).

In addition, our data shows that male and female respondents in the Global South engage with OER in similar ways, with adapting resources to fit one's needs being a more frequently reported behaviour than creating resources and sharing them openly. In like manner, YouTube, TEDTalks and Khan Academy are the most popular repositories, irrespective of gender, and open textbooks, ebooks and videos being the most commonly used types of OER.

Impact of using OER on teaching practices

Figure 3 shows a frequencies analysis of how female educators assess the impact of using OER on their teaching practices. An independent samples t-test revealed a statistically significant difference between women in the Global North and Global South in relation to the impact of OER on curriculum coverage ($t = 3.17$, $df = 561$, $p < .005$) and on the teaching and learning methods used ($t = 2.16$, $df = 563$, $p < .05$); women in the Global South ($M = 2.26$, $SD = 1.13$) perceive that OER use facilitates their greater coverage of the curriculum compared to women in the Global North ($M = 2.58$, $SD = .99$), and report that OER have broadened the range of teaching and learning methods they use in their classrooms ($M = 2.23$, $SD = 1.13$) more often than women in the Global North ($M = 2.45$, $SD = 1.0$). Statistically significant differences were also found that relate to the impact of OER on the development of ICT skills ($t = 3.09$, $df = 207.8$, $p < .005$) and use of multimedia ($t = 2.70$, $df = 546$, $p < .05$): female educators in developing countries ($M = 2.39$, $SD = 1.2$) report a greater improvement in their ICT skills than their counterparts in the developed world ($M = 2.74$, $SD = 1.02$), and also indicate they make use of a wider range of multimedia ($M = 2.24$, $SD = 1.06$) in comparison with women in the Global North ($M = 2.52$, $SD = 1.03$).

Table 8 shows how female and male respondents in the Global South understand their teaching practices have been affected by the use of OER. Men seem to think that the impact is more strongly felt in their coverage of the curriculum, reflecting on the way they teach and broadening the range of teaching and learning methods used; women, however, regard the latter as the biggest impact of OER on their teaching, adding the effect on having a more up-to-date knowledge of their subject area and having broadened the range of multimedia they use in the classroom. One caveat, though; an independent samples t-test reveals that only the difference in use of multimedia carries statistical significance ($t = 2.31$, $df = 299$, $p < .05$).

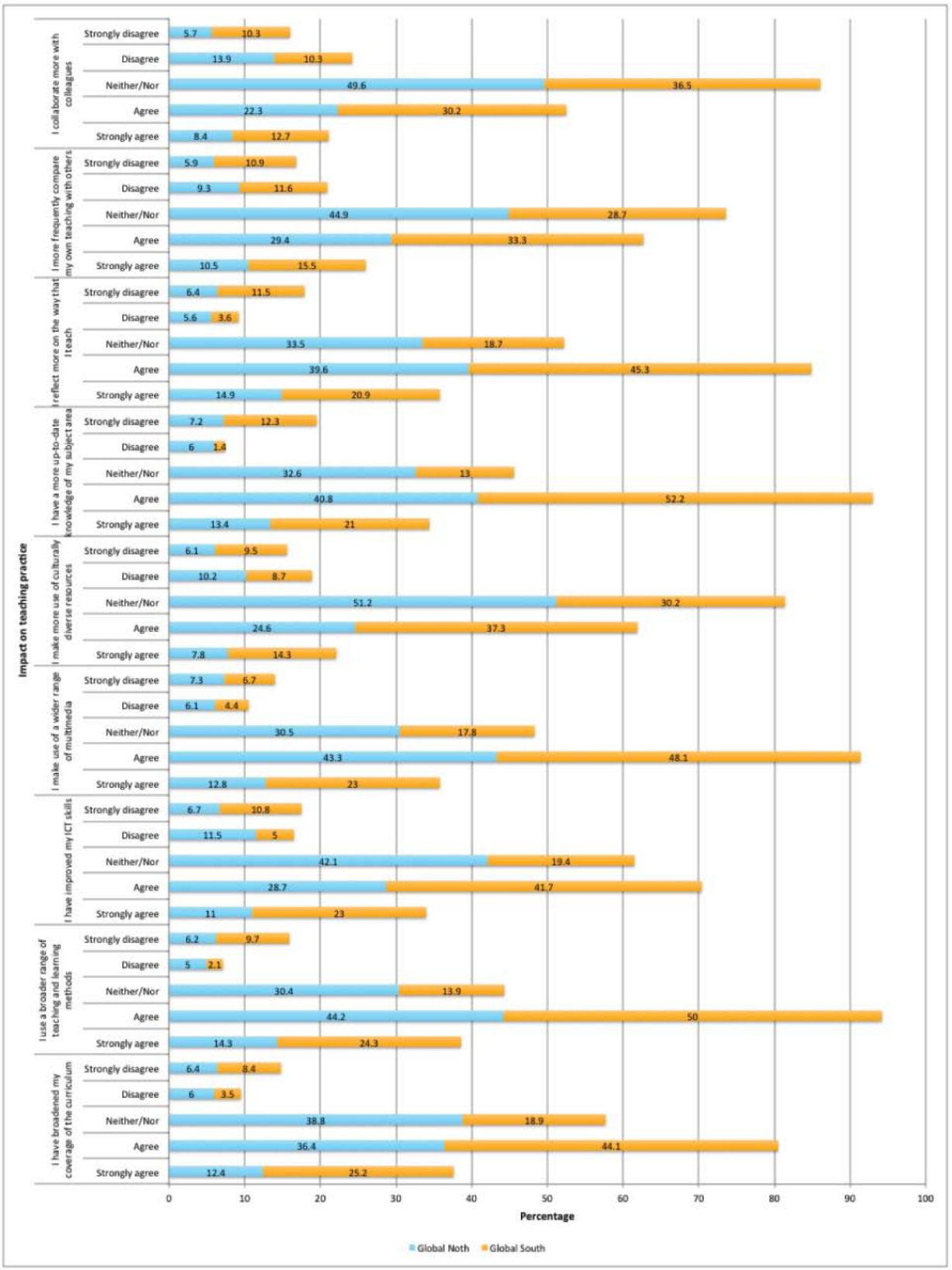

Figure 3: Impact of OER use on teaching practices for female educators in the Global South/North

Table 8: Differences in perceived impact of OER on teaching practices by gender

	GLOBAL SOUTH			
	FEMALE		MALE	
	Count	%	Count	%
I have broadened my coverage of the curriculum	99	69.2	124	68.5
I use a broader range of teaching and learning methods	107	74.3	111	63.8
I have improved my skills in information and communication technologies	90	64.7	97	55.7
I make use of a wider range of multimedia	96	71.1	100	59.5
I make more use of culturally diverse resources	65	51.6	82	50.6
I have a more up-to-date knowledge of my subject area	101	73.2	108	63.2
I reflect more on the way that I teach	92	66.2	108	65.9
I more frequently compare my own teaching with others	63	48.8	87	52.4
I now use OER study to develop my teaching	66	56.4	71	49.3
I collaborate more with colleagues	54	42.9	85	51.5

Implications

The findings discussed above show that the fairly small (in relation to the total OERH dataset), fairly well-educated group of female survey respondents that feature in our research are using OER relatively extensively for professional development, to train others, to improve their language skills, to broaden their range of teaching resources and to improve their teaching practice. However, our research is limited by our well-educated, Internet-connected self-selecting sample. It is clear, though, that these survey respondents are still facing barriers to their engagement with OER and OEP and reference to related literature indicates that a much wider range of barriers are in operation in the developing world and are preventing women from online participation and the potential for empowerment that it offers.

Engagement with OER and OEP, and women's empowerment

On the basis of O'Neil et al.'s (2014, p. 1) definition of women's empowerment as "a process of personal and social change through which [women] gain power, meaningful choices and control over their lives" it is apparent that OER, and OEP such as resource adaptation, sharing, collaboration and peer support have potential to achieve increased women's empowerment. More specifically, our analysis of the OERH dataset offers an indication that both OER and OEP can help (some) women in the Global South to gain financial power and autonomy through low cost professional development and, following Gurumurthy and Chami (2014), to gain:

- Informational power: by giving women access to quality education, and to relevant, accurate and up-to-date information, including information on health, parenting and civic/political issues; and

- Associational power: by giving free access to knowledge that could lead to women's increased civic and political participation and engagement (also involving women gaining 'communicative power'); by promoting and supporting networking with peers within and beyond the global south, through a culture of openness; and, through capacity-building, whereby OER are used by women to train others, resulting in a multiplier effect.

The level of OER and OEP engagement shown by the OERH female survey respondents (and indeed the male respondents) in the Global South is particularly impressive considering the fact that our research suggests, in common with other studies (e.g. Perryman & Seal, 2015; Perryman & Lesperance, 2015; Perryman, 2013), that female educators, formal learners and informal learners in the Global South face greater barriers to OER use than do similar categories of people in the Global North, especially in terms of the availability and reliability of technology and Internet access, the lack of resources relevant to local contexts and in specific subject areas, and a perceived lack of skill to adapt OER. This level of engagement, in the face of increased challenges over those experienced in the Global North, also echoes other, non-gender-focused studies (e.g. Perryman & Seal, 2015; Perryman & Lesperance, 2015).

Limitations of our research

The relatively small number of OERH survey respondents from the developing world, and the even smaller percentage of female survey respondents from this area, indicates that empowerment through openness is being enjoyed by people who are already empowered. Indeed, the demographic of our sample suggests that OER use and OEP amongst women in the Global South may be limited to a particularly well-qualified elite and it is important to acknowledge that our research covers a limited, self-selecting sample that reflects the gender equality imbalances in the developing world. Inevitably, the OERH survey data, all collected online, does not cover people excluded from OER use and ICT due to lack of connectivity, equipment, opportunity and/or skill.

Recommendations

The World Wide Web Foundation (2015) report makes recommendations for measures that could help increase women's digital inclusion (and, consequently, their engagement with OER and OEP), in the interests of empowerment:

1. Establish time-bound targets for equity in Internet access, use and skills, by gender and income level.
2. Teach digital skills from primary school onwards.
3. Smash the affordability barrier.
4. Practice woman-centred design.
5. Make women's civic and political engagement an explicit goal.
6. Combat harassment of women online.
7. 'It's not (just) the technology, stupid'.

In 7 above, the report makes the important point that:

> Empowering women does not happen in separate boxes labelled "offline" and "online", but requires progress across several fronts at once. Government agencies, civil society groups and private sector stakeholders will need to work together in all sectors to ensure that ICT initiatives are systematically integrated with wider efforts to expand women's choices and capabilities in the labour market, in the home, at school and in public life. Training policymakers across different sectors (such as health, education, small business, agriculture) to understand and harness the potential of ICTs to tackle poverty and gender inequality may be a good starting point. (World Wide Web Foundation, 2015, p. 7)

More specifically, any increase in women's empowerment through openness (and ICT engagement more broadly) needs to follow, or parallel, the removal of other, micro-level, meso-level and macro-level (Potnis, 2015) factors connected with gender inequality such as lack of financial autonomy, low levels of literacy, child marriage, early motherhood, gender-based violence, traditional seclusion practices, the favouring of boys in families' education investment, and the gendered division of household labour—all identified by UNESCO (2015, p.26) as amongst the "structural barriers and entrenched discriminatory social norms' that impede women's empowerment", and featuring in Gurumurthy and Chami's (2014) research framework (Figure 1) and Potnis's (2015) table of barriers reinforcing the gender-related digital divide (Table 1).

We strongly support the World Wide Web Foundation recommendations above, including their assertion that social, political, cultural and economic changes in the offline world are vital for achieving women's empowerment both generally and through the use of ICTs (and, it follows, through engagement with OER and OEP). However, we have limited our own recommendations to those which researchers and OER/OEP projects can realistically achieve:

1. **Extend the practice of releasing OER in a variety of formats, to mitigate against the cost barrier to engagement:**

The World Wide Web Foundation report (2015) suggests that cost is a major inhibitor to Internet connectivity and use of ICTs by women in developing countries, noting that:

> In the countries in our study, a monthly prepaid data allocation of one GB (enough for just 13 minutes of Web use a day, excluding video) costs, on average, about 10% of average per capita income. That's 10 times more than what the same data costs the average OECD citizen, relative to income, and is double what people in developing countries spend on healthcare (p. 4).

The consideration of cost is particularly pertinent to our own research in suggesting that it is possible that the 'freeness' of 'online only' OER would be irrelevant where the cost of connecting to the Internet to access such OER is prohibitive. While it has long been voiced that "no well-known definition of Open Educational Resources (OERs) states that the resource must be available online" and "in fact OERs do not even have to be digital" (Open Knowledge Foundation, 2014), the majority of OER are released solely in digital format. That said, various OER for development projects (e.g. TESS-India) have been releasing multi-format versions of resources, including print, CD, SD card and radio-delivered versions, in order to meet the needs of their target users. We fully support the Open Knowledge Foundation (2014) recommendation that "when a version is available online there is need to encourage OER producers to offer an offline/portable version wherever feasible" and, indeed, we propose that this should be the default practice when creating and releasing OER.

2. **Prioritise the development of communities of practice (Wenger, 1998) for the creation of OER and enactment of OEP, to include women at all stages of empowerment:**

Glennie, Harley, Butcher and van Wyk (2012, p. v) note the dangers of OER for development projects involving "the rich north [pushing] resources at the poor south" without thought of reciprocity, leading to one-directional flows of knowledge and resources—a tendency that replicates broader trends in international development. Acknowledging this, Perryman, Buckler and Seal (2014, p. 1) argue that "when collaboration is embedded within OER production and localisation, their creation and use can lead to a knowledge partnership approach whereby communities of OER practice engage in mutually beneficial sharing of expertise and contextual understanding". We propose that it is important to have women as *creators* as well as consumers of ICTs (and OER), and that OER projects should seek to develop user-centred communities of practice such as those featuring in the Karnataka OER project (http://karnatakaeducation.org.in/KOER/en/index.php/Main_Page; see

also Perryman, 2013) and operating in the Virtual University for Small States of the Commonwealth (see Perryman & Lesperance, 2015), as a means of providing skills development and peer support around women's creation, use and evaluation of OER.

3. **Move into the offline world when conducting research on ICTs and openness, and explore a broader range of barriers to digital participation and engagement with openness:**

The World Wide Web Foundation (2015) identify a correlation between women's activities offline and online, for example in noting that:

> Women who are active in "offline" political and civic life are not only more likely to be connected in the first place, but are also three times more likely (controlling for education level, age and income) to use the Internet to express opinions on important or controversial issues than other women. We need to better understand this synergy between offline and online agency in order to learn how gender norms that silence women in both realms can be overcome (p. 5).

It is clear that purely online research will only perpetuate the gender-related digital divide and we recommend that future research on openness in development contexts should include hard copy surveys delivered to hard-to-reach areas. In the next phase of our own research we will be conducting a new survey, covering a wider range of barriers to ICT/OER/OEP engagement, including societal, economic and cultural inhibitors to participation, specifically targeted to women, and conducted both online and offline.

4. **Prioritise the localisation of existing OER, including translation into mother tongue languages to increase accessibility and relevance:**

Removing technological barriers to openness by increasing Internet connectivity and ICT availability and reliability, making ICTs more affordable to use, and minimising societal barriers to digital participation will not be effective in increasing engagement with OER if resources are contextually inappropriate and are inaccessible due to the language in which they are presented. Robinson-Pant (2007, p. 429) points out that "in many countries of the world there is gendered access to languages" and "whereas men and boys have often had the opportunity to learn the language of power at school, women may only know how to speak their mother tongue". IBIS (2014, p. 2) concur that "marginalised people (especially women) speak languages that are often not valued or even recognised outside their communities" and that these "'linguistic minorities' often outnumber speakers of the dominant/national language". Consequently, IBIS argue, "the question of language thus has huge implications for participation, governance, citizenship, fulfilment of rights and the distribution of power and resources". We believe that the 'question of language' also has huge implications for empowerment through openness and we therefore recommend that OER localisation should include translation into mother tongue languages where possible. Ivins (2012, p. 219) argues that "localization must involve locals; a community of practice bolsters localization; localization must be done in appropriate formats; and effective localization is directly proportional to understanding local contexts". Accordingly, localising resources on a community of practice, or crowd-sourced basis could be of value here in drawing on the skills of experts in these languages.

Conclusion

So, what can the open education movement do to help increase women's empowerment through openness, and specifically OER and OEP? We propose that while top-down initiatives can be effective in attracting funding and institutional support for projects intended to achieve transformation in a development context it is also crucial for such projects to have a bottom-up focus driven by the people they are aiming to help. Communities of practice (Wenger, 1998) such as Karnataka OER

can work well in this regard, especially in facilitating capacity building. However, communities of practice such as Karnataka OER are often dependent on at least some Internet connectivity and ICT skill amongst members and, for some women, participation in such communities is precluded by societal and structural factors such as discrimination, isolation, lack of autonomy and financial power, and lack of access to education. These basic 'unfreedoms' (Sen, 1999) need to be removed before the full potential of openness can be realised. Advocacy, activism and raising awareness is important here and, indeed, the 2015 SDG have driven a renewed focus on this in relation to SDG5. Partnerships with NGOs and other organisations working in the Global South can also work well in informing localisation of OER in terms of language, content and appropriate formats. Above all, we recommend that all OER and OEP projects operating in the Global South should have a gender equality component to ensure the privileges typically enjoyed by the open education movement can be leveraged to help contribute to achieving widespread women's empowerment, on a global scale, as swiftly as possible.

Acknowledgement

This paper was presented at the 2016 Open Education Consortium Global Conference, held in Kraków (Poland) in April 12th-14th 2016 (http://conference.oeconsortium.org/2016/), with whom *Open Praxis* established a partnership. After a pre-selection by the Conference Programme Committee, the paper underwent the usual peer-review process in *Open Praxis*.

References

Buckler, A., Perryman, L. Seal, T. & Musafir, S. (2014). The role of OER localisation in building a knowledge partnership for development: insights from the TESSA and TESS-India teacher education projects. *Open Praxis, 6*(3), 221–233. http://dx.doi.org/10.5944/openpraxis.6.3.136

de los Arcos, B., Farrow, R., Perryman, L., Pitt, R. & Weller, M. (2014). *OER Evidence Report 2013–2014*. Retrieved from http://oro.open.ac.uk/41866

Glennie, J., Harley, K., Butcher, N. & van Wyk, T. (2012). *Open Educational Resources and Change in Higher Education: Reflections from Practice*. Vancouver: Commonwealth of Learning. Retrieved from http://www.col.org/PublicationDocuments/pub_PS_OER_web.pdf

Gurumurthy, A. & Chami, N. (2014). *Gender equality in the information society: a review of current literature and recommendations for policy and practice.* IT for Change & BRIDGE. Retrieved from http://www.gender-is-citizenship.net/women-and-governance/sites/gender-is-citizenship.net.women-and-governance/files/Final%20India%20Research%20Brief_September2014.pdf

IBIS (2014). *Concept paper: Mother tongue—bilingual education.* Retrieved from http://ibis-global.org/sites/default/files/media/pdf_global/methods_and_approaches/concept_paper_layout_final_-_mother_tongue.pdf

IT for Change (2014). *WWW Research Study on 'ICTs for Empowerment of Women and Girls.'* Retrieved from http://www.itforchange.net/WWW_Research_Study_on_ICTs_for_Empowerment_of_Women_and_Girls

Ivins, T. (2012) Localization of OER in Nepal: Strategies of Himalayan Knowledge Workers. *Proceedings of Cambridge 2012: Innovation and Impact—Openly Collaborating to Enhance Education, a joint meeting of OER12 and OpenCourseWare Consortium Global 2012*. Cambridge, UK.

Kabeer, N. (1999). Resources, Agency, Achievements: Reflections on the Measurement of Women's Empowerment. *Development and Change, 30*, 435–464. Retrieved from https://www.utsc.utoronto.ca/~kmacd/IDSC10/Readings/research%20design/empowerment.pdf

Kleine, D. (2008). *ICT4What?—Using the Choice Framework to operationalize the Capability Approach to Development*. Retrieved from http://courses.cs.washington.edu/courses/cse590f/09sp/ictd09/Kleine.pdf

Mijumbi, R. (2002). ICTs as a tool for economic empowerment of women: experiences from the use of a CD ROM by rural women in Uganda. *Report for United Nations Division for the Advancement of Women*. Retrieved from http://www.un.org/womenwatch/daw/egm/ict2002/reports/Paper-RMijumbi.PDF

Open Knowledge Foundation (2014). Do open educational resources have to be online? *Open Education Handbook.* Retrieved from http://booktype.okfn.org/open-education-handbook/_draft/_v/1.0/do-open-educational-resources-have-to-be-online/

O'Neil, T., Domingo, P. & Valters, C. (2014). *Progress on Women's empowerment: From technical fixes to political action.* Development Progress Working Paper 06. Retrieved from http://www.developmentprogress.org/sites/developmentprogress.org/files/case-study-report/progress_on_womens_empowerment_-_from_technical_fixes_to_political_action_final_-_20-11-14.pdf

Patil, D., Dhere, A., and Pawar, C., (2009). ICT and empowerment of rural and deprived women in Asia. *Asia-Pacific Journal of Rural Development* 19(1): 1–22.

Perryman, L. (2013). Addressing a national crisis in learning: open educational resources, teacher-education in India and the role of online communities of practice. *Seventh Pan-Commonwealth Forum on Open Learning (PCF7), 2–6 Dec 2013, Abuja, Nigeria*. Retrieved from http://oro.open.ac.uk/39658/1/Addressing%20a%20national%20crisis%20in%20learning%20PCF7.pdf

Perryman, L., Buckler, A. & Seal, T. (2014). Learning from TESS-India's Approach to OER Localisation Across Multiple Indian States. *Journal of Interactive Media in Education, 2014*(2), 7. http://dx.doi.org/10.5334/jime.af

Perryman, L. & Lesperance, J. (2015). Collaborating across borders: OER use and open educational practices within the Virtual University for Small States of the Commonwealth*. Open Education Global Conference 2015, 22–24 April, 2015, Banff, Alberta, Canada.* Retrieved from http://oro.open.ac.uk/43344

Perryman, L. & Seal, T. (2015). Open educational practices and attitudes to openness across India: reporting the findings of the OER Research Hub pan-India survey. *OER15, 14–15 April 2015, Cardiff*. Retrieved from http://oro.open.ac.uk/43345

Potnis, D. (2015). Inequalities creating economic barriers to owning mobile phones in India: Factors responsible for the gender digital divide. *Information Development*, 1–11. http://dx.doi.org/10.1177/0266666915605163

Robinson-Pant, A. (2007). 'Literacy'. In B. Bank (ed.). *Gender and Education: An encyclopaedia. Volume 1.* (p. 429). London: Praeger.

Sandys, E. (2005). Women 2000 and Beyond, *Gender Equality and Empowerment of Women Through ICT*, United Nations Division for the Advancement of Women. Retrieved from http://www.un.org/womenwatch/daw/public/w2000-09.05-ict-e.pdf

Sen, A. (1999). *Development As Freedom*. Oxford: Oxford University Press.

UNESCO (2015). *Education for All Global Monitoring Report 2015: Gender and EFA 2000–2015 achievements and challenges.* Retrieved from http://unesdoc.unesco.org/images/0023/002348/234809E.pdf?new

Wenger, E. (1998). *Communities of Practice: learning, meaning and identity.* London: Cambridge University Press.

World Wide Web Foundation (2015). *Women's Rights Online: Translating Access into Empowerment.* Retrieved from http://webfoundation.org/about/research/womens-rights-online-2015/